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| EXAMINER |
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VELASQUEZ, VANESSA T

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| ART UNIT | PAPER NUMBER |
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1793

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08/05/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto.phil@dlapiper.com

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/587,222 | Applicant(s) FUJISAWA ET AL. | |
| | Examiner Vanessa Velasquez | Art Unit 1793 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-16 and 18-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-16 and 18-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/14/2010 has been entered.

Status of Previous Objections

The previous rejections of claims 1 and 12-15 are withdrawn in view of the amendments to the claims.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
5. Claims 12, 16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espy (US 3,736,131) in view of Durand-Charre (*Microstructure of Steels and Cast Irons*).

Regarding claims 12 and 20, Espy teaches a duplex ferritic-austenitic stainless steel having the following composition (col. 3, TABLE I, Heat No. E):

| Element | Claim 12 | US 3,736,131 |
|-----------------|--------------------|--------------|
| C | about 0.2 or less | 0.020 |
| Si | about 4 or less | 0.38 |
| Mn | about 10 or less | 5.96 |
| P | about 0.1 or less | 0.004 |
| S | about 0.03 or less | 0.008 |
| Cr | about 15 - 35 | 21.07 |
| Ni | about 1 - 3 | 2.58 |
| N | about 0.05 - 0.6 | 0.23 |
| Fe + impurities | balance | balance |

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The amount of austenite is 65% (TABLE II, Heat No. E, annealed condition). The elongation of the steel is 48% (TABLE IX, Heat No. E, annealed condition). The alloy has a calculated $Md(y)$ value of 20, which satisfies the claimed equation. The sum of the C and N elements is 0.25 (obtained by adding 0.020 and 0.23). Espy does not explicitly teach that the stainless steel has excellent deep drawability. However, this would be a property inherent to the steel of Espy because of it has a chemical composition identical to that of the claimed invention. See MPEP § 2112.01(I)-(II).

Espy does not expressly teach that C and N reside in the austenitic phase. Durand-Charre teaches that C and N stabilize austenite and are not easily soluble in ferritic stainless steels (page 323, Section 19-6, first paragraph). The remaining phase in the duplex steel of Espy is ferrite. Therefore, one of ordinary skill in the art would expect for substantially all or most of the C and N in the stainless steel of Espy to reside in the austenitic phase.

Regarding claim 16, Espy teaches that Cu may be present in a maximum amount of 0.5% and Mo may substitute Cr in amounts of up to 5% (col. 2, lines 18-24).

6. Claims 14, 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espy (US 3,736,131) in view of Maehara et al. (US 4,721,600).

Regarding claim 14, Espy teaches a duplex ferritic-austenitic stainless steel having the following composition (col. 3, TABLE I, Heat No. P):

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| Element | Claim 14 | US 3,736,131 |
|-----------------|--------------------|--------------|
| C | about 0.2 or less | 0.008 |
| Si | about 1.2 or less | 0.40 |
| Mn | about 4 - 12 | 8.77 |
| P | about 0.1 or less | 0.009 |
| S | about 0.03 or less | 0.008 |
| Cr | about 15 - 35 | 20.93 |
| Ni | about 1 or less | 0.20 |
| N | about 0.05 - 0.6 | 0.25 |
| V | 0.005 - 0.5 | silent |
| Fe + impurities | balance | balance |

The amount of austenite is 38% (TABLE II, Heat No. P, annealed condition). The alloy has a calculated $Md(\gamma)$ value of 65, which satisfies the claimed equation. The alloy has good corrosion resistance in an as-welded condition (col. 2, lines 1-5).

Espy teaches that the elongation of the steel is 47% (TABLE IX, Heat No. P, annealed condition). It is acknowledged that this value does not overlap the claimed range. However, it is well known to one of ordinary skill in the metallurgical arts that the value obtained from measuring percent elongation varies depending on the starting length of the tensile specimen; the shorter the gauge length of the original tensile specimen, the larger the percent elongation calculated (Holt, p. 131, Fig. 14). Given the substantially identical compositions between the claims and prior art, one of ordinary skill in the art would expect the steel of Espy to possess a ductility value of 48% or larger when measured under the conditions of the present specification. See also MPEP § 2112.01(I)-(II).

Espy does not teach the inclusion of vanadium. Maehara et al. teach that the addition of 0.01-5.0% V to duplex stainless steels further enhances their corrosion resistance (col. 11, lines 7-11). Therefore, it would have been obvious to one of

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ordinary skill in the art to have added V to the stainless steel of Espy for the purpose of increasing its ability to resist corrosion.

Regarding claim 16, Espy teaches that Cu may be present in a maximum amount of 0.5% and Mo may substitute Cr in amounts of up to 5% (col. 2, lines 18-24).

Regarding claims 18 and 19, Espy does not teach the inclusion of aluminum, calcium, magnesium, and rare earth metals. Maehara et al. teach that the addition of up to 0.1% Al and small amounts of Ca, Mg, and REM (small amounts being interpreted as impurity level) helps to deoxidize the duplex stainless steel (col. 11, lines 17-21). Therefore, it would have been obvious to one of ordinary skill in the art to have added Al, Ca, Mg, and REM to the stainless steel of Espy for the purpose of deoxidizing the steel.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espy (US 3,736,131) in view of Maehara et al. (US 4,721,600), as applied to claim 14 above, and further in view of Durand-Charre (*Microstructure of Steels and Cast Irons*).

Regarding claim 20, Espy discloses that C and N are 0.25 and 0.008, respectively. Thus, their sum is 0.258 (obtained by adding 0.25 and 0.008). Espy does not expressly teach that C and N reside in the austenitic phase. Durand-Charre teaches that C and N stabilize austenite and are not easily soluble in ferritic stainless steels (page 323, Section 19-6, first paragraph). The remaining phase in the duplex steel of Espy is ferrite. Therefore, one of ordinary skill in the art would expect for

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substantially all or most of the C and N in the stainless steel of Espy to reside in the austenitic phase.

8. Claims 12-15, 16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maehara et al. (US 4,721,600).

Regarding claims 12-15, Maehara et al. teach a duplex-phase steel with the following compositions (col. 10, lines 31-38; col. 17, claims 1 and 4):

| Element | Claim 12 | Claim 13 | US 4,721,600 |
|-----------------|--------------------|--------------------|-------------------------|
| C | about 0.2 or less | 0.05 or less | 0 - 0.05 |
| Si | about 4 or less | about 1.2 or less | not less than 0.5 |
| Mn | about 10 or less | about 2 or less | not less than 1.7 |
| P | about 0.1 or less | about 0.1 or less | at most 0.05 |
| S | about 0.03 or less | about 0.03 or less | at most 0.02 |
| Cr | about 15 - 35 | about 15 - 35 | 0 - 20.0 |
| Ni | about 1 - 3 | 0.9 or less | 0 - 5.0 |
| N | about 0.05 - 0.6 | about 0.05 - 0.6 | at least 0.01 up to 0.3 |
| Fe + impurities | balance | balance | balance |

| Element | Claim 14 | Claim 15 | US 4,721,600 |
|-----------------|--------------------|--------------------|--------------|
| C | about 0.2 or less | about 0.2 or less | 0 - 0.05 |
| Si | about 1.2 or less | about 0.4 or less | 0.1 - 20.0 |
| Mn | about 4 - 12 | about 2 - 4 | 0.1 - 30.0 |
| P | about 0.1 or less | about 0.1 or less | at most 0.05 |
| S | about 0.03 or less | about 0.03 or less | at most 0.02 |
| Cr | about 15 - 35 | about 15 - 35 | 5.0 - 15.0 |
| Ni | about 1 or less | about 1 or less | 0.05 - 4.0 |
| N | about 0.05 - 0.6 | about 0.05 - 0.6 | 0.05 - 0.25 |
| V | 0.005 - 0.5 | not claimed | 0 - 0.3 |
| Fe + impurities | balance | balance | balance |

The ratio of austenite (γ) to the sum of austenite (γ) and ferrite (α) phases is 0.2-0.8 (i.e., austenite is 20-80%) (col. 6, lines 1-7). The corresponding ductility at those phase ranges is well above 50% (Fig. 1). Maehara et al. do not explicitly teach that the

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stainless steel is deep drawable, punch-stretchable, crevice and weld part corrosion resistant, and resistant to corrosion at intergranular interfaces. However, these properties would be inherent to the steels of Maehara et al. because they possess a chemical composition that is substantially identical to that of the claimed invention. See MPEP § 2112.01(I)-(II). The overlap between the ranges in the prior art and the claims creates a *prima facie* case of obviousness. See MPEP § 2144.05.

Maehara et al. are silent as to whether the claimed equation is satisfied by their steels. However, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art (*In re Cooper and Foley*, 1943 C.D. 357, 553 O.G. 177, 57 USPQ 117; *Saklatwalla v. Marburg*, 80 USPQ 439, C.C.P.A. 1949; and *In re Application of Norman B. Pilling*, 7 USPQ 138, C.C.P.A. 1930). In the absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art (*In re Austin, et al.*, 149 USPQ 685, 688).

Regarding claims 12 and 20, Maehara et al. disclose that the sum of C and N may be 0.35 (col. 17, claim 1) and 0.30 (col. 17, claim 4). These elements are more easily dispersed in the austenitic (γ) phase (col. 11, lines 40-45). Therefore, one of ordinary skill in the art would expect for substantially all or most of the C and N in the stainless steel to reside in the austenitic phase.

Regarding claim 16, Maehara et al. teach that Mo may be present in amounts of 0-6.0% or 0.05-4.0% (col. 17, claims 1 and 4, respectively). Cu may be present in amounts of 0-1.0% or 0.0-0.6% (col. 17, claims 1 and 4, respectively).

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Regarding claims 18 and 19, Maehara et al. teach that the addition of up to 0.1% Al and small amounts of Ca, Mg, and REM (small amounts being interpreted as impurity level) helps to deoxidize the duplex stainless steel (col. 11, lines 17-21).

9. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfonsso et al. (US 2003/0172999 A1).

Regarding claims 14 and 15, Alfonsso et al. teach ferritic-austenitic stainless steels with the following composition (abstract; paragraphs [0021]-[0031]):

| Element | Claim 14 | Claim 15 | US 2003/0172999 A1 |
|-----------------|--------------------|--------------------|--------------------|
| C | about 0.2 or less | about 0.2 or less | 0.005 - 0.07 |
| Si | about 1.2 or less | about 0.4 or less | 0.1 - 2.0 |
| Mn | about 4 - 12 | about 2 - 4 | 3 - 8 |
| P | about 0.1 or less | about 0.1 or less | 0.035 max. |
| S | about 0.03 or less | about 0.03 or less | 0.10 max. |
| Cr | about 15 - 35 | about 15 - 35 | 19 - 23 |
| Ni | about 1 or less | about 1 or less | 0.5 - 1.7 |
| N | about 0.05 - 0.6 | about 0.05 - 0.6 | 0.15 - 0.30 |
| V | 0.005 - 0.5 | not claimed | see examples |
| Fe + impurities | balance | balance | balance |

The amount of austenite is 35-65 volume % (abstract). The sum of the C and N elements is 0.155-0.37 (obtained by adding C and N ranges). Alfonsso et al. do not explicitly teach that the stainless steel is corrosion resistant at weld parts and between grains and has an elongation of 48% or greater. However, these properties would be expected to be inherent to the steel of Alfonsso et al. because it has a chemical composition and microstructure identical to that of the claimed invention. See MPEP § 2112.01(I)-(II).

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Alfonsson et al. do not teach the claimed equation. However, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art (*In re Cooper and Foley*, 1943 C.D. 357, 553 O.G. 177, 57 USPQ 117; *Saklatwalla v. Marburg*, 80 USPQ 439, C.C.P.A. 1949; and *In re Application of Norman B. Pilling*, 7 USPQ 138, C.C.P.A. 1930). In the absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art (*In re Austin, et al.*, 149 USPQ 685, 688).

10. Claims 12, 16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfonsson et al. (US 2003/0172999 A1), as applied to claims 14 and 15, and further in view of Durand-Charre (*Microstructure of Steels and Cast Irons*).

Regarding claims 12 and 20, Alfonsson et al. teach an embodiment of a ferritic-austenitic stainless steel with the following composition (TABLE 1, Heat/steel V251):

| Element | Claim 12 | US 2003/0172999 A1 |
|-----------------|--------------------|--------------------|
| C | about 0.2 or less | 0.052 |
| Si | about 4 or less | 0.30 |
| Mn | about 10 or less | 5.26 |
| P | about 0.1 or less | 0.012 |
| S | about 0.03 or less | 0.004 |
| Cr | about 15 - 35 | 21.52 |
| Ni | about 1 - 3 | 1.48 |
| N | about 0.05 - 0.6 | 0.225 |
| Fe + impurities | balance | balance |

The amount of austenite is about 50 volume % (Fig. 2, V251). The alloy has a calculated $Md(\gamma)$ value of 29, which satisfies the claimed equation. The sum of the C

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and N elements is 0.277 (obtained by adding 0.225 and 0.052). Alfonsson et al. do not explicitly teach that the stainless steel has excellent deep drawability or an elongation of 48% or greater. However, these properties would be expected to be inherent to the steel of Alfonsson et al. because it has a chemical composition, microstructure, and $Md(\gamma)$ identical to that of the claimed invention. See MPEP § 2112.01(I)-(II).

Alfonsson et al. do not expressly teach that C and N reside in the austenitic phase. Durand-Charre teaches that C and N stabilize austenite and are not easily soluble in ferritic stainless steels (page 323, Section 19-6, first paragraph). The remaining phase in the duplex steel of Alfonsson et al. is ferrite. Therefore, one of ordinary skill in the art would expect for substantially all or most of the C and N in the stainless steel of Alfonsson et al. to reside in the austenitic phase.

Regarding claim 16, Alfonsson et al. teach Mo and Cu contents of 0.32% and 0.18%, respectively (TABLE 1, Heat/steel V251).

Regarding claim 18, Alfonsson et al. teach an Al content of 0.016% (TABLE 1, Heat/steel V251).

Regarding claim 19, Alfonsson et al. teach B and Ti contents of 0.0004% and 0.0.004%, respectively (TABLE 1, Heat/steel V251).

Response to Arguments

11. Applicant's arguments filed 4/14/2010 have been fully considered but they are not persuasive.

First, Applicants argue that the steels of Alfonsson et al. are not *prima facie* obvious over the claimed invention because they have elongations that are less than the claimed 48% or larger. In response, the Examiner disagrees for at least two reasons: (1) It is well known to one of ordinary skill in the metallurgical arts that the value obtained from measuring percent elongation depends on the starting length of the tensile specimen; the shorter the gauge length of the original tensile specimen, the larger the percent elongation calculated (Holt, p. 131, Fig. 14). Therefore, unless the tensile specimens in Alfonsson et al. were measured in the same manner as that of Applicants' steels, Applicants cannot assert that objective evidence is already of record showing that the elongations are actually different. (2) The elongation values of three steels in Table 2 are not necessarily representative of other steels that may fall in the inventive range of Alfonsson et al. Therefore, it cannot be conclusively stated that each and every steel sample of Alfonsson et al. has an elongation falling "in a range of 36-40%" (p. 6 of Remarks).

Second, Applicant compares the specific inventive steels from the present application to the parameters of Alfonsson et al. to show that the claimed invention is not obvious in light of the disclosure of Alfonsson et al. In response, the comparison is not commensurate in scope with the claimed invention. What Applicants have done is mapped specific inventive steels to a chart in the prior art. However, such a comparison is not sufficient because the entire claimed range, not just specific inventive embodiments, must be taken into account. See MPEP § 716.02(d).

Applicants' arguments with respect to Matsui have been considered but are moot as it is no longer relied upon in claim rejections.

Pertinent Prior Art

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: **US 6,344,094 B1** to Hineno et al. discloses a ferritic-austenitic stainless steel with relevant composition.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vanessa Velasquez whose telephone number is 571-270-3587. The examiner can normally be reached on Monday-Friday 9:00 AM-6:00 PM ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached at 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Vanessa Velasquez/
Examiner, Art Unit 1793

/Scott Kastler/
Primary Examiner, Art Unit 1793